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ABSTRACT

Empirical evidence is presented regarding the use of the estimated learning potential (ELP). The data reported come from three instruments: the Wechsler Intelligence Scale for Children-Revised (WISC-R), the reading and math components of the California Achievement Tests, and the System of Multicultural Pluralistic Assessment (SOMPA) Sociocultural Modalities Scales. Four modalities (family size/structure, socioeconomic status, and urban acculturaltion) were used for establishing the ELP from the WISC-R data. The sample was drawn from three racial-ethnic groups and two social classes in grades 1 through 8. Results show the common tendency for middle class children to outperform the lower class on IQ and achievement, as well as the relative ranking of the racial-ethnic groups on IQ and achievement data. The IQ correlations for reading and math tend to be stronger for lower class children within each racial-ethnic group. The concurrent prediction of reading and math achievement is accomplished more accurately with IQs than ELPs. Compared to WISC-R IQs, the adjustment of IQs to form an estimated learning potential tends to decrease the test's effectiveness to predict current and later achievement. (GK)

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Predictive Validity of the WISC-R IQs and Estimated Learning Potential

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How to use tests fairly and accurately with persons from different racial-ethnic and social class groups has been a continuing issue for education and psychology and remains a vital issue in the 1980's. Previous approaches include developing culture-fair tests and devising culture-fair selection models. More recently Mercer (1978) proposed the use of an estimated learning potential (ELP) as another means to more accurately describe the intellectual abilities of children from minority groups and to predict later performance. This paper presents empirical evidence regarding the use of the ELP.

Method

The data reported herein come from three major instruments: the Wechsler Intelligence Scale for Children-Revised (WISC-R), the reading and math components of the California Achievement Series, and the System of Multicultural Pluralistic Assessment's (SOMPA) Sociocultural Modalities Scales (Mercer & Lewis, 1978). The Sociocultural Modalities Scales assess the social and cultural characteristics of a child's family background in four areas: family size, family structure, socioeconomic status, and urban acculturation. These four modalities are used as the

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basis for establishing the ELP from the WISC-R data.[1] Achievement data were obtained on two occasions, once when the other data were obtained (the spring of 1976) and again three years later (the spring of 1979).

A stratified random sampling design was employed to select 467 children from grades 1 through 8 from the three racial-ethnic groups (Anglo, Black, Mexican American), from two social classes (middle and lower) and of both genders from a public school population of 55,000. IQ and achievement tests were administered to children; sociocultural data were obtained through mother interviews.

The Pearson correlations of achievement with IQ and ELP allow us to examine concurrent and predictive relationships for children from the two social classes and the three racial-ethnic groups.

Results and Discussion

The means, standard deviations, and sample sizes for the total group, for the two social classes, and for racial-ethnic by social class are reported (Table 1) to describe the sample. The total group approximates a normal sample with respect to IQ and achievement. The tendency for middle class children to outperform lower class children on IQ and achievement is common within the U.S. and is present here. The relative ranking of the racial-ethnic groups on the IQ and achievement data (e.g., Anglo, Mexican American, and Black) also is common. The ELPs tend to

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[1] $ELP = (\text{actual IQ} - \text{estimated IQ}/SE_{est})\ (15) + 100$

Estimated IQ is determined by summing the weighted scores from Mercer's Sociocultural Modality Scale (i.e., family size, family structure, SES, and urban acculturation) and adding a constant. The estimated IQ is the average score predicted for persons having a particular combination of sociocultural characteristics. Thus, the estimated IQ is the average score of persons from a particular sociocultural background, a norm for that group.

be higher than the IQs from which they are derived. This is particularly apparent among lower class children, especially the blacks and Mexican Americans.

Concurrent Relationships

The IQ-achievement correlations for reading and math are approximately .70 for the total group and in the low to mid .60s for the two social classes. Among the three racial-ethnic groups the correlations are about 10 points higher for Anglos than for the blacks and Mexican Americans. Within each racial-ethnic group the correlations tend to be somewhat stronger for lower class children.

In contrast, the ELP-achievement correlations for the total group are in the high .40s. Differences among the correlations from the middle and lower class are sizable. Differences among the correlations from the three racial-ethnic groups are slightly greater, too. The correlations for blacks are highest, followed by Mexican-Americans and Anglos. Within the blacks and Anglos, the correlations are higher for lower class children.

The concurrent prediction of reading and math achievement clearly is accomplished more accurately with IQs than ELPs. ELP-achievement correlations never exceed those between IQ-achievement. Among the 24 pairs of correlations, 13 IQ-achievement correlations are significantly higher than those for ELP-achievement; the remaining 11 pairs are not statistically different. Significant differences are least apparent for lower class Anglo, for middle class Mexican-American, and for black children.

Predictive Relationships

The IQ-achievement correlations for reading and math are in the .70s for the total group and in the .60s and .70s for the two social classes.

Among the three racial-ethnic groups the correlations generally are in the low .70s and fairly similar with one exception (the .59 IQ-math correlation among blacks). Within the racial-ethnic groups, somewhat higher correlations are reported for middle class Anglos and Mexican Americans and for lower class blacks.

In contrast, the ELP-achievement correlations are in the mid-.50s for the total group and the two social classes. The correlations again differ markedly between the three racial-ethnic groups. The correlations for Anglos tend to be in the mid.40s, for blacks in the low.50s to .60s and for the Mexican Americans in the mid.50s to .70s. Within each racial-ethnic group somewhat higher correlations are reported for lower class Anglos and blacks and for middle class Mexican Americans.

Differences among the IQ and ELP to predict later achievement continue to favor IQ. Thirteen of the 24 pairs of correlations again are statistically significant in favor of IQ predicting achievement. All of the remaining 11 pairs of correlations are not statistically different. As with the concurrent data, significant differences between using the IQ or ELP to predict later achievement is least apparent for lower class Anglo, for middle class Mexican American, and for blacks.

Summary and Conclusions

Thus, compared to WISC-R IQs, the adjustment of IQs to form an estimated learning potential tends either to decrease or to not improve the test's effectiveness to predict current and later achievement.

The magnitude of the IQ-achievement correlations generally is high, accounting for about 50% of the variance associated with both reading and math. There is a tendency for the predictive coefficients to be higher than the concurrent coefficients; this is particularly true for Mexican

American children. The concurrent coefficients for blacks and Mexican Americans tend to be similar and lower than those for Anglos. The predictive coefficients for Anglos and Mexicans tend to be similar and higher than those for blacks.

References

Mercer, J. R., & Lewis, J. F. System of Multicultural Pluralistic Assessment. New York: Psychological Corporation, 1978.

TABLE 1

Means, Standard Deviations, and Ns for IQ, Estimated Learning Potential (ELP) and Achievement[1]

	N	IQ		ELP		Reading Achievement (1976)		Reading Achievement (1979)		Math Achievement (1976)		Math Achievement (1979)	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
TOTAL	396	98	16	99	15	4.9	2.1	5.1	2.0	5.0	2.0	5.4	2.1
Middle[2]	234	104	15	100	15	5.8	1.9	5.8	1.9	5.7	1.9	6.2	2.0
Lower	162	90	13	97	14	3.9	1.9	4.1	1.8	4.1	1.7	4.3	1.9
ANGLO	166	105	16	100	15	5.7	2.2	5.8	2.1	5.8	2.1	5.9	2.3
Middle	110	111	13	101	15	6.6	1.6	6.8	1.5	6.4	1.8	6.9	1.7
Lower	56	93	14	98	16	4.0	2.1	4.3	3.0	4.5	1.9	4.4	2.1
BLACK	122	92	13	99	14	4.6	2.0	4.7	1.7	4.5	1.8	4.8	2.0
Middle	67	96	13	100	16	4.9	1.9	5.0	1.7	4.8	1.7	5.2	1.9
Lower	55	87	12	98	12	4.1	1.9	4.1	1.6	4.1	1.7	4.2	2.0
MEXICAN AMERICAN	108	95	15	99	15	4.3	1.9	4.6	2.0	4.1	1.7	5.3	1.9
Middle	57	101	15	101	17	5.2	1.7	5.3	1.8	5.4	1.8	6.1	1.8
Lower	51	87	11	95	12	3.5	1.6	3.8	1.8	3.9	1.6	4.2	1.4

[1]Achievement scores are expressed in stanines. Years in parentheses refer to when the achievement data were acquired. IQ (and thus ELP) data were acquired in 1976.

[2]Middle and lower refer to family socioeconomic status designations.

TABLE 2

Correlations[1] of IQ and ELP with Achievement

	Concurrent (1976)[2]						Predictive (1979)					
	Reading			Math			Reading			Math		
	IQ	ELP	IQ-ELP	IQ	ELP	IQ-ELP	IQ	ELP	IQ-ELP	IQ	ELP	IQ-ELP
Total	71	48	23*	69	46	23*	74	55	19*	70	52	18*
Middle[3]	63	40	23*	60	40	20*	75	55	20*	66	50	16*
Lower	65	60	5	60	55	5	60	57	3	61	56	5
Anglo	73	43	30*	67	42	25*	72	46	26*	73	50	23*
Middle	58	37	21*	54	35	19*	67	47	20*	62	45	17*
Lower	61	60	1	57	57	0	50	49	1	58	58	0
Black	63	57	6	59	55	4	69	61	8*	59	51	8*
Middle	50	47	3	48	46	2	64	57	7*	49	48	1
Lower	75	68	7*	69	65	4	73	75	-2	67	64	3
Mexican American	64	50	14*	60	46	14*	75	71	4	71	63	8*
Middle	50	45	5	50	47	3	77	78	-1	66	68	-2
Lower	59	49	10*	50	41	9*	60	54	6	58	43	15*

[1]All decimals are removed

[2]Years in parentheses refer to when the achievement data were acquired. IQ (an thus ELP) data were acquired in 1976.

[3]Middle and low refer to family socioeconomic status designations.

* $p < .01$